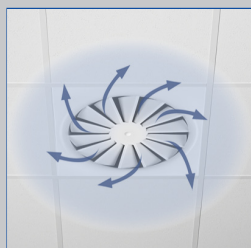
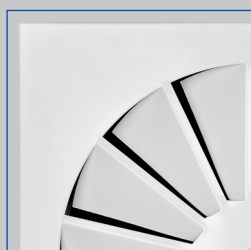


# Ceiling swirl diffusers

## Type RFD



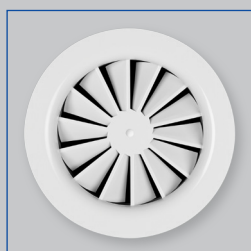
Horizontal swirling air discharge



Without discharge nozzle



With discharge nozzle



Circular diffuser face



### With low sound power level for comfort and industrial zones, with fixed air control blades

#### Circular and square ceiling swirl diffusers

- Nominal sizes 125, 160, 200, 250, 315, 400
- Volume flow rate range 4 – 330 l/s or 14 – 1188 m<sup>3</sup>/h
- Diffuser face made of galvanised sheet steel, powder-coated, or of aluminium (depending on variant)
- For supply and extract air
- For variable and constant volume flows
- For all types of ceiling systems
- With discharge nozzle ideal for cooling in case of freely suspended installation
- High induction results in a rapid reduction of the temperature difference and airflow velocity
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)
- Ideal for comfort zones

#### Optional equipment and accessories

- Exposed diffuser face available in RAL CLASSIC colours
- Horizontal or vertical duct connection
- Plenum box with cord-operated damper blade and pressure tap
- Shallow plenum box

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## Application

### Application

- Type RFD ceiling swirl diffusers are used as supply air or extract air diffusers for comfort zones
  - Attractive design element for building owners and architects with demanding aesthetic requirements
  - Horizontal swirling supply air discharge for mixed flow ventilation
  - The efficient swirl creates high induction levels, thereby rapidly reducing the temperature difference and airflow velocity (supply air variant)
  - For variable and constant volume flows
  - For supply air to room air temperature differences from –12 to +10 K
  - For room heights up to 4 m (lower edge of suspended ceiling)
- For all types of ceiling systems
  - With an extended border and discharge nozzle also suitable for freely suspended installation (supply air variant)

### Special characteristics

- Low sound power level, ideal for comfort zones
- Fixed blades
- For all types of ceiling systems
- Horizontal or vertical duct connection
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)

### Nominal sizes

- 125, 160, 200, 250, 315, 400

## Description

### Variants

- RFD-Q: Square diffuser face
- RFD-R: Circular diffuser face
- RFD-\*D: Diffuser face with discharge nozzle

### Connection

- K: Vertical duct connection, with duct collar
- US: Vertical duct connection, with transition piece
- A: Horizontal duct connection, with plenum box

### Only RFD-R

- UO: Vertical duct connection, with transition piece and cross bar

### Only RFD-R-D

- UD: Vertical duct connection, with transition piece, cross bar and discharge nozzle
- N: Horizontal duct connection, with shallow plenum box to be installed above open cell ceilings

### Parts and characteristics

- Circular or square diffuser face
- Diffuser face with radially arranged fixed air

control blades

### Attachments

- M: Damper blade for volume flow rate balancing
- MN: Pressure tap and cord-operated damper blade for volume flow rate balancing with the diffuser face in place

### Accessories

- Lip seal

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

### Materials and surfaces

- Q: Diffuser face made of aluminium
- R: Diffuser face made of galvanised sheet steel
- Plenum box, duct collar and cross bar made of galvanised sheet steel
- Transition piece made of aluminium
- Lip seal made of rubber
- Diffuser face powder-coated RAL 9010, pure

- white
- P1: Powder-coated, RAL CLASSIC colour

**Standards and guidelines**

- Sound power level of the air-regenerated noise measured according to EN ISO 5135

**Maintenance**

- Maintenance-free as construction and materials are not subject to wear
- Inspection and cleaning to VDI 6022

### Functional description

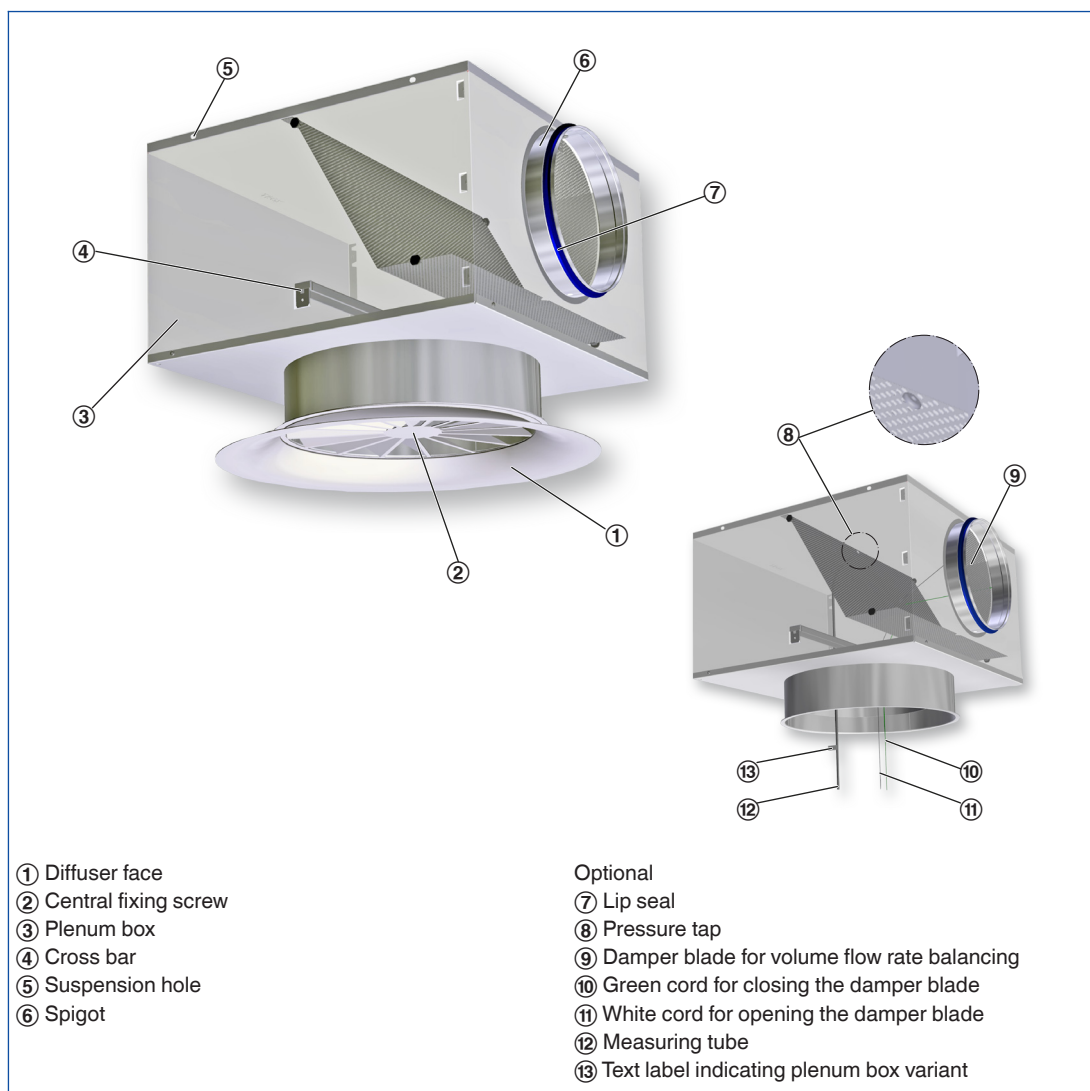
Ceiling swirl diffusers in air conditioning systems create a swirl to supply air to rooms. The resulting airflow induces high levels of room air, thereby rapidly reducing the airflow velocity and the temperature difference between supply air and room air. Ceiling swirl diffusers allow for large volume flow rates. The result is a mixed flow ventilation in comfort zones, with good overall room ventilation, creating only very little turbulence in the occupied zone. Type RFD ceiling swirl diffusers have fixed blades.

Air discharge is horizontal omni directional. The supply air to room air temperature difference may range from  $-12$  to  $+10$  K.

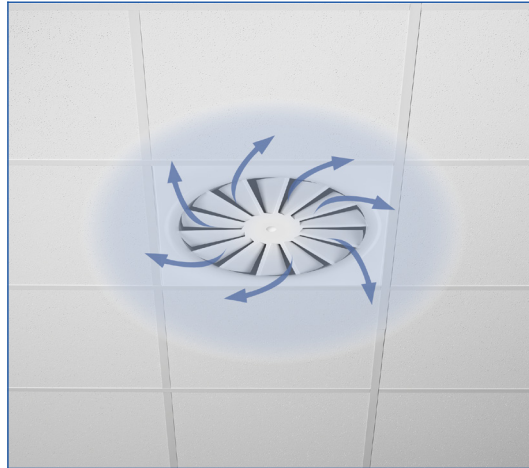
A damper blade (optional) simplifies volume flow rate balancing for commissioning. Pressure tap and cord-operated damper blade (optional) allow for volume flow rate balancing with the diffuser face in place.

To give rooms an aesthetic, uniform look, Type RFD diffusers may also be used for extract air.

### Schematic illustration of the RFD-R-D, with plenum box for horizontal duct connection



Horizontal omni directional air discharge



Nominal sizes	125, 160, 200, 250, 315, 400 mm
Minimum volume flow rate, with $\Delta t_z = -6$ K	4 – 36 l/s or 14 – 130 m <sup>3</sup> /h
Maximum volume flow rate, with $L_{WA} \cong 50$ dB(A)	22 – 330 l/s or 79 – 1188 m <sup>3</sup> /h
Supply air to room air temperature difference	-12 to +10 K

Quick sizing tables provide a good overview of the volume flow rates and corresponding sound power levels and differential pressures.

The minimum volume flow rates apply to a supply air to room air temperature difference of  $-6$  K.

The maximum volume flow rates apply to a sound power level of approx. 50 dB (A) with damper blade position  $0^\circ$ .

Exact values for all parameters can be determined with our Easy Product Finder design programme.

**RFD-\*-K, sound power level and total differential pressure**

Nominal size	$\dot{V}$		$\Delta p_t$	$L_{WA}$
	l/s	m <sup>3</sup> /h	Pa	dB(A)
125	4.4	16	2	<15
	10	36	16	29
	15	54	36	38
	24	86	92	50
160	5	18	1	<15
	15	54	8	16
	30	108	34	34
	47	169	83	50
200	7	25	1	<15
	30	108	15	26
	50	180	43	38
	75	270	96	50
250	10	36	1	<15
	45	162	14	27
	80	288	43	41
	114	410	87	50
315	19	68	1	<15
	75	270	12	25
	130	468	37	40
	185	666	75	50
400	27	97	1	<15
	95	342	12	26
	165	594	35	40
	230	828	69	50

RFD\*-D-K, sound power level and total differential pressure

Nominal size	$\dot{V}$		$\Delta p_t$ Pa	$L_{WA}$ dB(A)
	l/s	m <sup>3</sup> /h		
125	4.4	16	1	<15
	15	54	8	18
	30	108	33	36
	46	166	79	50
160	6.4	23	1	<15
	25	90	8	16
	45	162	26	33
	76	274	74	50
200	9	32	0	<15
	45	162	11	23
	75	270	31	37
	110	396	66	50
250	14	50	0	<15
	65	234	10	21
	115	414	33	38
	164	590	66	50
315	25	90	1	<15
	95	342	11	23
	165	594	32	38
	240	864	67	50
400	36	130	1	<15
	135	486	12	24
	235	846	36	40
	330	1188	71	50

RFD\*-US, sound power level and total differential pressure

Nominal size	$\dot{V}$		$\Delta p_t$ Pa	$L_{WA}$ dB(A)
	l/s	m <sup>3</sup> /h		
125	4	14	2	<15
	10	36	17	28
	15	54	37	39
	22	79	80	50
160	5	18	1	<15
	20	72	15	24
	30	108	35	37
	42	151	68	50
200	7	25	1	<15
	30	108	22	23
	50	180	60	39
	70	252	117	50
250	10	36	1	<15
	45	162	19	25
	80	288	61	40
	114	410	123	50
315	19	68	1	<15
	70	252	17	25
	130	468	59	42
	170	612	101	50
400	27	97	1	<15
	90	324	15	24
	155	558	44	39
	220	792	88	50



RFD-\*-D-US, sound power level and total differential pressure

Nominal size	$\dot{V}$		$\Delta p_t$	$L_{WA}$
	l/s	m <sup>3</sup> /h	Pa	dB(A)
125	4.4	16	1	<15
	15	54	10	17
	25	90	28	34
	38	137	64	50
160	6	22	1	<15
	25	90	9	16
	45	162	29	35
	66	238	62	50
200	9	32	1	<15
	40	144	22	20
	70	252	66	37
	102	367	140	50
250	14	50	1	<15
	60	216	21	22
	105	378	63	39
	145	522	120	50
315	25	90	2	<15
	90	324	21	22
	155	558	62	38
	220	792	125	50
400	36	130	1	<15
	120	432	17	22
	205	738	49	38
	285	1026	95	50

RFD-\*-A, sound power level and total differential pressure

Nominal size	$\dot{V}$	$\dot{V}$	Damper blade position					
			0°		45°		90°	
			$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$
l/s	m <sup>3</sup> /h	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)	
125	4	14	2	<15	3	<15	4	<15
	10	36	17	28	19	28	26	28
	15	54	38	38	43	39	58	38
	22	79	82	50	93	49	124	50
160	5	18	1	<15	1	<15	1	<15
	15	54	9	16	11	17	15	15
	30	108	35	34	43	36	60	34
	47	169	86	50	105	51	147	51
200	7	25	1	<15	1	<15	1	<15
	25	90	12	21	15	21	20	21
	44	158	36	35	45	36	61	35
	70	252	91	50	114	52	156	51
250	10	36	1	<15	1	<15	1	<15
	45	162	14	25	19	26	25	25
	75	270	40	38	52	40	70	39
	110	396	86	50	113	52	151	52
315	19	68	1	<15	1	<15	2	<15
	70	252	12	24	17	26	22	24
	120	432	35	39	49	40	63	38
	175	630	75	50	103	52	135	50
400	27	97	1	<15	1	<15	1	<15
	90	324	10	24	13	25	17	24
	160	576	33	40	40	41	53	39
	220	792	63	50	75	52	100	49

RFD\*-D-A, sound power level and total differential pressure

Nominal size	$\dot{V}$ l/s	$\dot{V}$ m <sup>3</sup> /h	Damper blade position					
			0°		45°		90°	
			$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$	$\Delta p_t$	$L_{WA}$
			Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
125	4.4	16	1	<15	1	<15	3	<15
	15	54	12	19	17	20	33	23
	30	108	48	37	68	40	132	41
	43	155	98	50	139	52	271	53
160	6.4	23	1	<15	1	<15	2	<15
	30	108	16	22	24	22	44	25
	50	180	45	37	68	38	123	41
	71	256	91	50	138	53	250	54
200	9	32	1	<15	1	<15	2	<15
	40	144	13	21	19	22	34	24
	70	252	39	37	59	38	104	40
	105	378	89	50	133	53	234	54
250	14	50	1	<15	1	<15	2	<15
	60	216	12	20	18	23	32	23
	108	389	39	37	58	39	103	40
	153	551	79	50	116	53	207	52
315	25	90	1	<15	2	<15	2	<15
	90	324	13	23	20	25	29	25
	150	540	35	38	55	40	82	40
	215	774	72	50	114	52	168	52
400	36	130	1	<15	1	<15	2	<15
	120	432	11	23	15	23	22	23
	205	738	33	38	44	39	65	39
	290	1044	65	50	87	50	131	51

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

Ceiling swirl diffusers with square or circular diffuser face. Supply air and extract air variants for comfort zones and industrial zones. Diffuser face with fixed air control blades for horizontal swirling supply air discharge creating high induction levels. For installation into all types of suspended ceilings.

Ready-to-install component which consists of the diffuser face with radially arranged fixed air control blades and either a spigot only or a plenum box with side entry or top entry spigot, and suspension holes or suspension lugs.

The diffuser face is fixed to the cross bar with a central screw.

Spigot suitable for ducts to EN 1506 or EN 13180.

Sound power level of the air-regenerated noise measured according to EN ISO 5135.

### Special characteristics

- Low sound power level, ideal for comfort zones
- Fixed blades
- For all types of ceiling systems
- Horizontal or vertical duct connection
- Air change rates of up to 35 per hour can be achieved by arranging several diffusers in a row with a minimum pitch of 0.9 m (centre line to centre line)

### Materials and surfaces

- Q: Diffuser face made of aluminium
- R: Diffuser face made of galvanised sheet steel
- Plenum box, duct collar and cross bar made of galvanised sheet steel
- Transition piece made of aluminium
- Lip seal made of rubber
- Diffuser face powder-coated RAL 9010, pure white
- P1: Powder-coated, RAL CLASSIC colour

### Technical data

- Nominal sizes: 125, 160, 200, 250, 315, 400 mm
- Minimum volume flow rate, with  $\Delta t_z = -6$  K: 4 – 36 l/s or 14 – 130 m<sup>3</sup>/h
- Maximum volume flow rate, with  $L_{WA} \cong 50$  dB(A): 22 – 330 l/s or 79 – 1188 m<sup>3</sup>/h
- Supply air to room air temperature difference: -12 to +10 K

### Sizing data

- $\dot{V}$  \_\_\_\_\_  
[m<sup>3</sup>/h]
- $\Delta p_t$  \_\_\_\_\_  
[Pa]
- Air-regenerated noise
- $L_{WA}$  \_\_\_\_\_  
[dB(A)]

RFD

<b>RFD – Q – D – A – M – L / 200 / P1 – RAL ...</b>							
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>

**1** Type

**RFD** Swirl diffuser

**2** Construction style

**R** Circular

**Q** Square

**3** Construction

No entry: without discharge nozzle

**D** With discharge nozzle

**4** Connection

**K** Vertical, with duct collar

**US** Vertical, with transition piece

**A** Horizontal, with plenum box

Only RFD-R

**UO** Vertical, with transition piece and cross bar

Only RFD-R-D

**UD** Vertical, with transition piece, cross bar and discharge nozzle

**N** Horizontal, with shallow plenum box

**5** Damper blade for volume flow rate balancing

No entry: none

**M** With (only for connection types A and N)

**MN** With cords and pressure tap (only for connection type A)

**Order example: RFD-Q-D-A-M-L/200/P1-RAL 9016**

<b>Construction style</b>	Square
<b>Construction</b>	With discharge nozzle
<b>Connection</b>	Horizontal
<b>Damper blade for volume flow rate balancing</b>	With
<b>Accessories</b>	Lip seal
<b>Nominal size</b>	200
<b>Exposed surface</b>	RAL 9016, traffic white, gloss level 70 %

**6** Accessories

No entry: none

**L** With lip seal (only for connection types A and N)

**7** Nominal size [mm]

**125**

**160**

**200**

**250**

**315**

**400**

**8** Exposed surface

No entry required

Powder-coated RAL 9010, pure white

Gloss level

RAL 9010 50 %

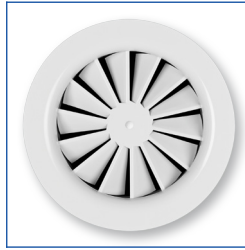
RAL 9006 30 %

All other RAL colours 70 %

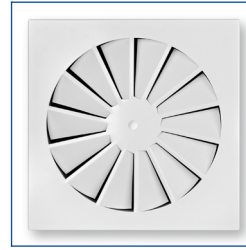
RFD-Q-D



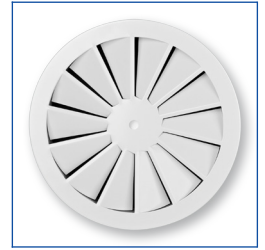
RFD-R-D



RFD-Q



RFD-R



RFD-Q-D-K



RFD-R-D-K



RFD-Q-US



RFD-R-UO



RFD-Q-D-A



RFD-R-D-A



RFD-R-D-N



**RFD-Q-K**

**Variant**

- Ceiling swirl diffuser with square diffuser face

**Nominal sizes**

- 125, 160, 200, 250, 315, 400

**Parts and characteristics**

- Square diffuser face
- Circular duct collar for connection to a vertical duct

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180

**RFD-Q-D-K**

**Variant**

- Ceiling swirl diffuser with discharge nozzle and square diffuser face

**Nominal sizes**

- 125, 160, 200, 250, 315, 400

**Parts and characteristics**

- Square diffuser face
- Discharge nozzle improves aerodynamic and acoustic characteristics
- Circular duct collar for connection to a vertical duct

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180

### RFD-Q-US

#### Variant

- Ceiling swirl diffuser with square diffuser face

#### Nominal sizes

- 125, 160, 200, 250, 315, 400

#### Parts and characteristics

- Square diffuser face
- Transition piece for connection to a vertical duct

#### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

### RFD-Q-D-US

#### Variant

- Ceiling swirl diffuser with discharge nozzle and square diffuser face

#### Nominal sizes

- 125, 160, 200, 250, 315, 400

#### Parts and characteristics

- Square diffuser face
- Discharge nozzle improves aerodynamic and acoustic characteristics
- Transition piece for connection to a vertical duct

#### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

### RFD-Q-A

#### Variant

- Ceiling swirl diffuser with square diffuser face

#### Nominal sizes

- 125, 160, 200, 250, 315, 400

#### Parts and characteristics

- Square diffuser face
- Plenum box for horizontal duct connection
- Circular opening to accommodate the diffuser face
- Simple installation of the diffuser face due to

- central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

#### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

### RFD-Q-D-A

#### Variant

- Ceiling swirl diffuser with discharge nozzle and square diffuser face

#### Nominal sizes

- 125, 160, 200, 250, 315, 400

#### Parts and characteristics

- Square diffuser face
- Discharge nozzle improves aerodynamic and acoustic characteristics
- Plenum box for horizontal duct connection
- Circular opening to accommodate the diffuser

- face
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

#### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

### RFD-R-K

#### Variant

- Ceiling swirl diffuser with circular diffuser face

#### Nominal sizes

- 125, 160, 200, 250, 315, 400

#### Parts and characteristics

- Circular diffuser face
- Circular duct collar for connection to a vertical duct

#### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180

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**RFD-R-D-K**

**Variant**

- Ceiling swirl diffuser with discharge nozzle and circular diffuser face

**Nominal sizes**

- 125, 160, 200, 250, 315, 400

**Parts and characteristics**

- Circular diffuser face
- Discharge nozzle improves aerodynamic and acoustic characteristics
- Circular duct collar for connection to a vertical duct

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- 

**RFD-R-US**

**Variant**

- Ceiling swirl diffuser with circular diffuser face

**Nominal sizes**

- 125, 160, 200, 250, 315, 400

**Parts and characteristics**

- Circular diffuser face
- Transition piece for connection to a vertical duct

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- 

**RFD-R-D-US**

**Variant**

- Ceiling swirl diffuser with discharge nozzle and circular diffuser face

**Nominal sizes**

- 125, 160, 200, 250, 315, 400

**Parts and characteristics**

- Circular diffuser face
- Discharge nozzle improves aerodynamic and acoustic characteristics
- Transition piece for connection to a vertical duct

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- 

**RFD-R-UO**

**Variant**

- Ceiling swirl diffuser with circular diffuser face

**Nominal sizes**

- 125, 160, 200, 250, 315, 400

**Parts and characteristics**

- Circular diffuser face

- Transition piece for connection to a vertical duct
- Simple installation of the diffuser face due to central fixing screw with decorative cap

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- 

**RFD-R-D-UD**

**Variant**

- Ceiling swirl diffuser with discharge nozzle and circular diffuser face

**Nominal sizes**

- 125, 160, 200, 250, 315, 400

**Parts and characteristics**

- Circular diffuser face

- Discharge nozzle improves aerodynamic and acoustic characteristics
- Transition piece for connection to a vertical duct
- Simple installation of the diffuser face due to central fixing screw with decorative cap

**Construction features**

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- 

**RFD-R-A**

**Variant**

- Ceiling swirl diffuser with circular diffuser face

### Nominal sizes

- 125, 160, 200, 250, 315, 400

### Parts and characteristics

- Circular diffuser face
- Plenum box for horizontal duct connection
- Circular opening to accommodate the diffuser face
- Simple installation of the diffuser face due to central fixing screw with decorative cap

- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip

### RFD-R-D-A

#### Variant

- Ceiling swirl diffuser with discharge nozzle and circular diffuser face

#### Nominal sizes

- 125, 160, 200, 250, 315, 400

#### Parts and characteristics

- Circular diffuser face
- Discharge nozzle improves aerodynamic and acoustic characteristics
- Plenum box for horizontal duct connection
- Circular opening to accommodate the diffuser

- face
- Simple installation of the diffuser face due to central fixing screw with decorative cap
- Damper blade for volume flow rate balancing (optional)
- Pressure tap and cord-operated damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

#### Construction features

- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)

### RFD-R-D-N

#### Variant

- Ceiling swirl diffuser with discharge nozzle and circular diffuser face

#### Nominal sizes

- 125, 160, 200, 250, 315, 400

#### Parts and characteristics

- Circular diffuser face
- Discharge nozzle improves aerodynamic and acoustic characteristics
- Plenum box for horizontal duct connection

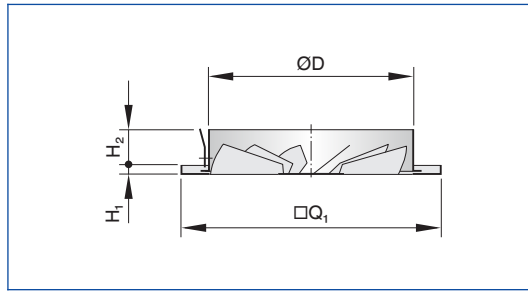
- Compact unit which consists of the diffuser and a plenum box, shallow construction for installation above open cell ceilings
- Damper blade for volume flow rate balancing (optional)
- Lip seal (optional)

#### Construction features

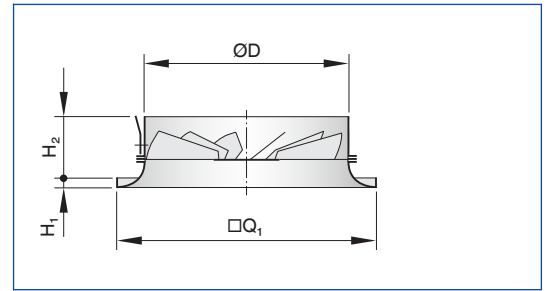
- Spigot suitable for circular ducts to EN 1506 or EN 13180
- Spigot with groove for lip seal (if accessory lip seal has been ordered)



RFD-Q-K



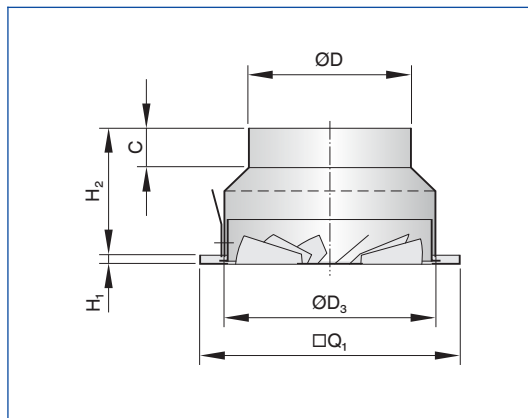
RFD-Q-D-K



RFD-Q-K, RFD-Q-D-K

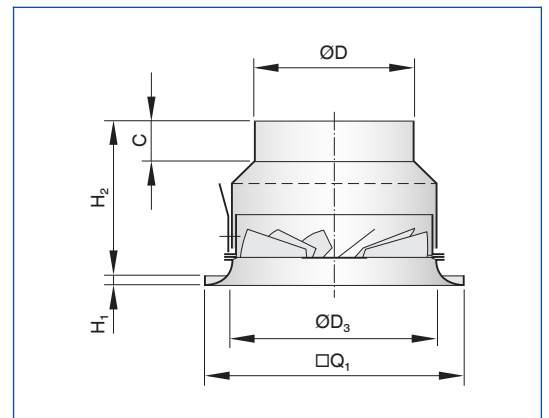
Nominal size	RFD-Q-K			RFD-Q-D-K			ØD	H <sub>1</sub>
	□Q <sub>1</sub>	H <sub>2</sub>	m	□Q <sub>1</sub>	H <sub>2</sub>	m		
	mm	mm	kg	mm	mm	kg		
125	198	42	0.6	198	67	0.7	123	8
160	198	45	0.7	248	70	0.9	158	8
200	248	45	1.0	248	70	1.2	198	8
250	298	42	1.5	298	67	1.7	248	8
315	398	45	2.4	398	80	2.9	313	8
400	498	45	3.6	498	80	4.3	398	8

RFD-Q-US



Sizes 125 and 160 without perforated sheet metal

RFD-Q-D-US

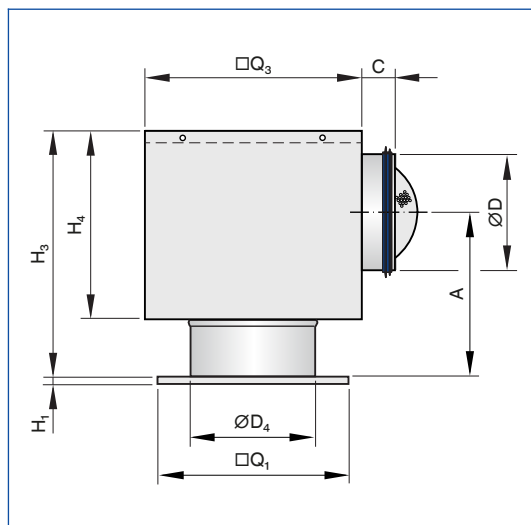


Sizes 125 and 160 without perforated sheet metal

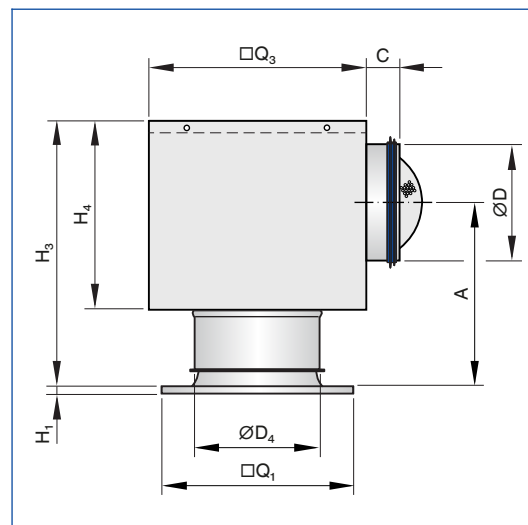
RFD-Q-US, RFD-Q-D-US

Nominal size	RFD-Q-US			RFD-Q-D-US			ØD	H <sub>1</sub>	ØD <sub>3</sub>	C
	□Q <sub>1</sub>	H <sub>2</sub>	m	□Q <sub>1</sub>	H <sub>2</sub>	m				
	mm	mm	kg	mm	mm	kg				
125	198	120	0.7	198	145	0.8	98	8	127	40
160	198	125	0.9	248	150	1.1	123	8	162	40
200	248	128	1.2	248	153	1.4	158	8	202	40
250	298	133	1.7	298	158	2.0	198	8	252	40
315	398	140	2.7	398	175	3.2	248	8	318	40
400	498	150	4.1	498	185	4.7	313	8	403	40

RFD-Q-A



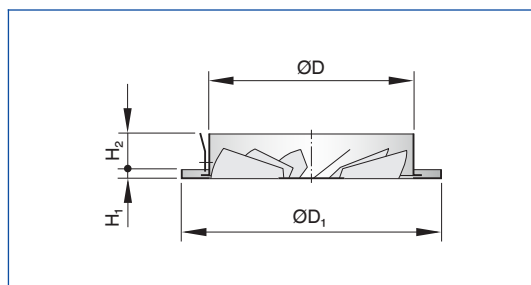
RFD-Q-D-A



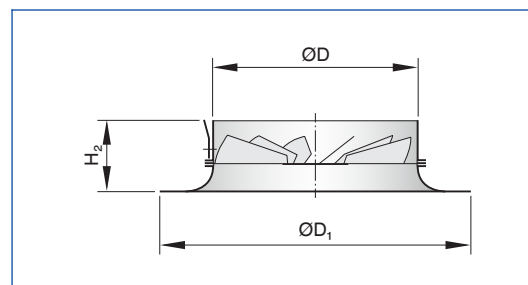
RFD-Q-A, RFD-Q-D-A

Nominal size	RFD-Q-A				RFD-Q-D-A				$H_1$	$Q_3$	$H_4$	$\varnothing D_4$	$\varnothing D$	C	Plenum box
	$Q_1$	$H_3$	A	m	$Q_1$	$H_3$	A	m							
	mm	mm	mm	kg	mm	mm	mm	kg							
125	198	255	170	3.0	198	276	196	3.1	8	216	195	125	98	50	AK-Uni-028
160	198	280	182	3.5	248	301	208	3.8	8	266	220	160	123	48	AK-Uni-029
200	248	310	194	4.3	248	331	220	4.5	8	290	250	200	158	50	AK-Uni-030
250	298	355	219	8.7	298	376	245	9.0	8	476	295	250	198	50	AK-Uni-031
315	398	395	244	12.0	398	436	281	12.5	8	567	345	315	248	48	AK-Uni-032
400	498	470	277	15.1	498	501	313	15.8	8	615	410	400	313	50	AK-Uni-033

RFD-R-K



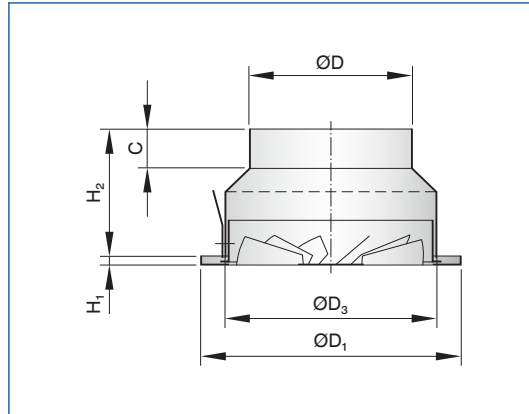
RFD-R-D-K



RFD-R-K, RFD-R-D-K

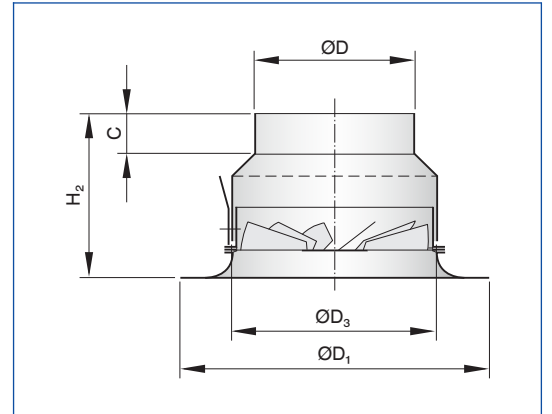
Nominal size	RFD-R-K			RFD-R-D-K			ØD	H <sub>1</sub>
	ØD <sub>1</sub>	H <sub>2</sub>	m	ØD <sub>1</sub>	H <sub>2</sub>	m		
	mm	mm	kg	mm	mm	kg		
125	158	42	0.4	200	67	0.5	123	8
160	197	45	0.6	250	70	1.0	158	8
200	241	45	0.9	300	70	1.3	198	8
250	295	42	1.3	350	67	1.8	248	8
315	364	45	1.9	450	80	2.8	313	8
400	450	45	2.9	580	80	4.1	398	8

RFD-R-US



Sizes 125 and 160 without perforated sheet metal

RFD-R-D-US

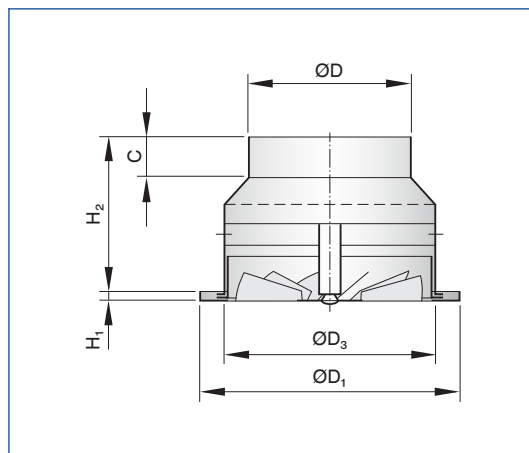


Sizes 125 and 160 without perforated sheet metal

RFD-R-US, RFD-R-D-US

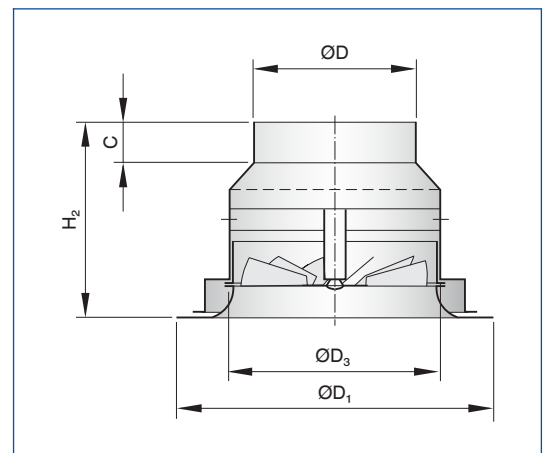
Nominal size	RFD-R-US			RFD-R-D-US			ØD	H <sub>1</sub>	ØD <sub>3</sub>	C
	ØD <sub>1</sub>	H <sub>2</sub>	m	ØD <sub>1</sub>	H <sub>2</sub>	m				
	mm	mm	kg	mm	mm	kg				
125	158	120	0.5	200	153	0.6	98	8	127	40
160	197	125	0.8	250	158	1.1	123	8	162	40
200	241	128	1.1	300	161	1.5	158	8	202	40
250	295	133	1.6	350	166	2.1	198	8	252	40
315	364	140	2.3	450	183	3.2	248	8	318	40
400	450	150	3.4	580	193	4.6	313	8	403	40

RFD-R-UO



Sizes 125 and 160 without perforated sheet metal

RFD-R-D-UO

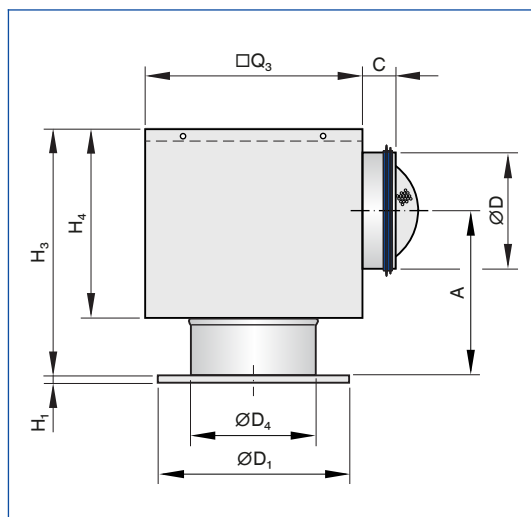


Sizes 125 and 160 without perforated sheet metal

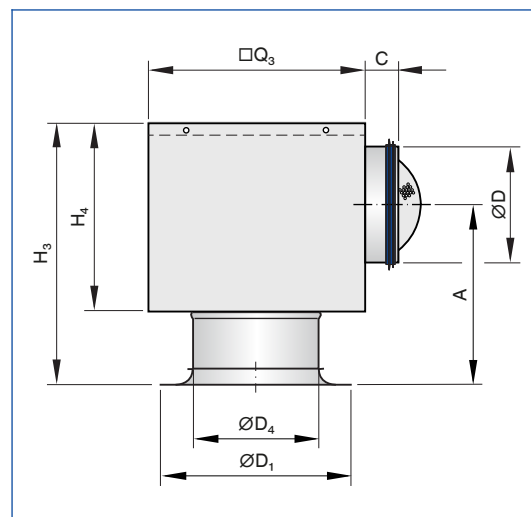
RFD-R-UO, RFD-R-D-UD

Nominal size	RFD-R-UO			RFD-R-D-UD			ØD	H <sub>1</sub>	ØD <sub>3</sub>	C
	ØD <sub>1</sub>	H <sub>2</sub>	m	ØD <sub>1</sub>	H <sub>2</sub>	m				
	mm	mm	kg	mm	mm	kg				
125	158	146	0.6	200	192	0.7	98	8	127	40
160	197	151	0.8	250	196	1.2	123	8	162	40
200	241	154	1.2	300	197	1.7	158	8	202	40
250	295	159	1.6	350	202	2.2	198	8	252	40
315	364	166	2.5	450	219	3.6	248	8	318	40
400	450	176	3.7	580	229	5.3	313	8	403	40

RFD-R-A



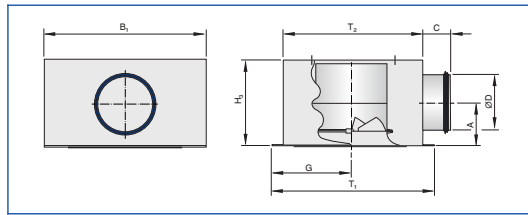
RFD-R-D-A



RFD-R-A, RFD-R-D-A

Nominal size	RFD-R-A				RFD-R-D-A				H <sub>1</sub>	□Q <sub>3</sub>	H <sub>4</sub>	ØD <sub>4</sub>	ØD	C	Ple-nium box
	ØD <sub>1</sub>	H <sub>3</sub>	A	m	ØD <sub>1</sub>	H <sub>3</sub>	A	m							
	mm	mm	mm	kg	mm	mm	mm	kg							
125	158	255	170	2.8	200	284	204	2.9	8	216	195	125	98	50	AK- Uni- 028
160	197	280	182	3.5	250	309	216	3.8	8	266	220	160	123	48	AK- Uni- 029
200	241	310	194	4.2	300	339	228	4.6	8	290	250	200	158	50	AK- Uni- 030
250	295	355	219	8.5	350	384	253	9.0	8	476	295	250	198	50	AK- Uni- 031
315	364	395	244	11.6	450	444	289	12.5	8	567	345	315	248	48	AK- Uni- 032
400	450	470	277	14.4	580	509	321	15.7	8	615	410	400	313	50	AK- Uni- 033

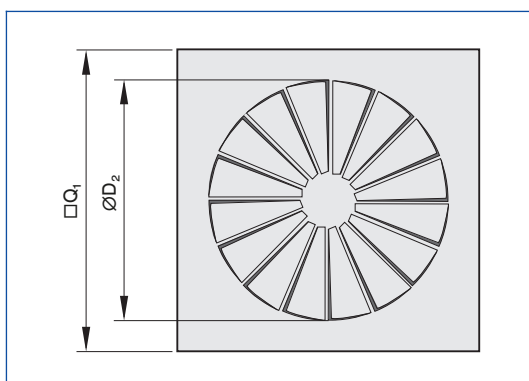
RFD-R-D-N



RFD-R-D-N

Nominal size	ØD mm	B <sub>1</sub> mm	T <sub>1</sub> mm	H <sub>3</sub> mm	T <sub>2</sub> mm	A mm	C mm	G mm	m kg
125	98	283	304	152	264	77	50	159	2.4
160	123	335	333	177	293	90	48	155	3.8
200	158	392	413	212	373	108	50	195	5.1
250	198	435	456	262	416	132	50	195	6.5
315	248	496	516	312	476	157	48	230	10.0
400	313	728	692	377	652	190	50	305	15.0

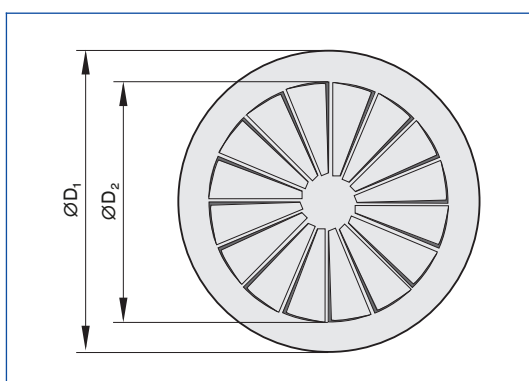
Diffuser face RFD-Q



RFD-Q

Nominal size	RFD-Q-K		RFD-Q-D-K		$\varnothing D_2$ mm
	$\square Q_1$ mm	$A_{\text{eff}}$ m <sup>2</sup>	$\square Q_1$ mm	$A_{\text{eff}}$ m <sup>2</sup>	
125	198	0.0026	198	0.0034	120
160	198	0.0037	248	0.0060	155
200	248	0.0066	248	0.0092	195
250	298	0.0110	298	0.0150	245
315	398	0.0205	398	0.0265	310
400	498	0.0280	498	0.0355	395

Diffuser face RFD-R



RFD-R

Nominal size	RFD-R-K		RFD-R-D-K		$\varnothing D_2$ mm
	$\varnothing D_1$ mm	$A_{\text{eff}}$ m <sup>2</sup>	$\varnothing D_1$ mm	$A_{\text{eff}}$ m <sup>2</sup>	
125	158	0.0026	200	0.0034	120
160	197	0.0037	250	0.0060	155
200	241	0.0066	300	0.0092	195
250	295	0.0110	350	0.0150	245
315	364	0.0205	450	0.0265	310
400	450	0.0280	580	0.0355	395

Installation in continuous ceilings

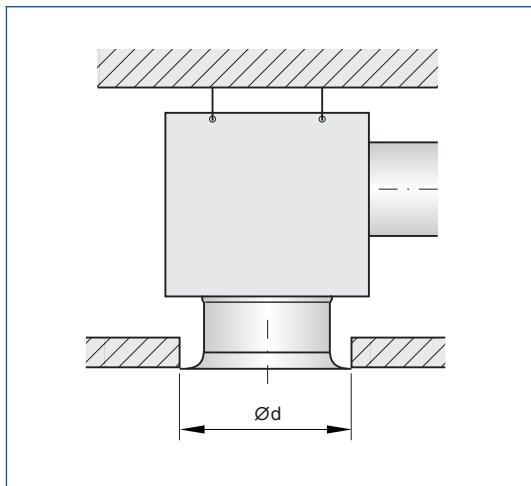


## Installation and commissioning

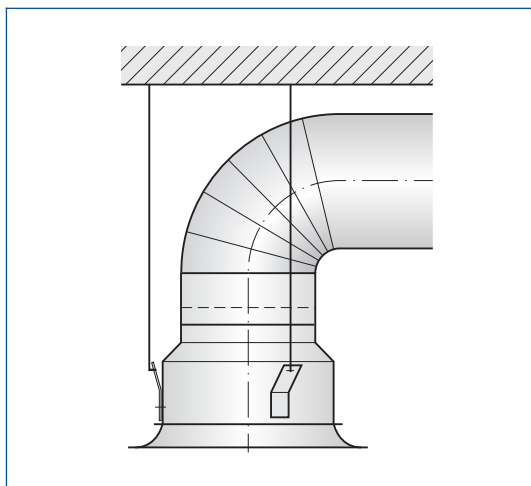
- Preferably for rooms with a clear height up to 4.0 m
- Flush ceiling installation
- RFD-\*-D: Also for freely suspended installation
- RFD-\*-UO, RFD-\*-UD: Clamping between ceiling tiles of up to 20 mm
- Horizontal or vertical duct connection

These are only schematic diagrams to illustrate installation details.

## Flush ceiling installation

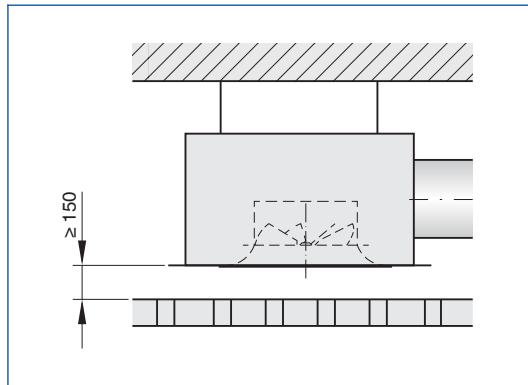


## Freely suspended installation

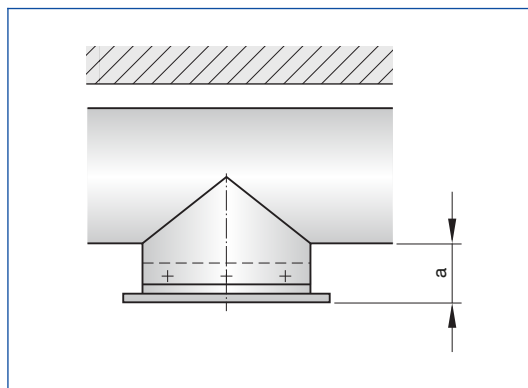




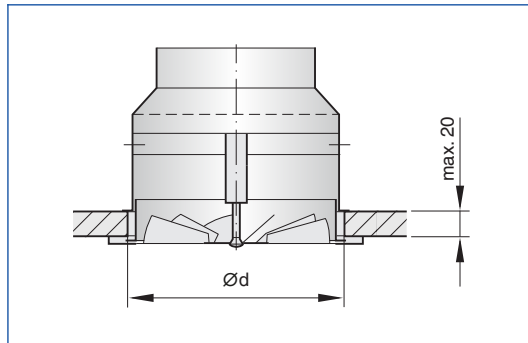
Installation above an open cell ceiling



Installation onto a duct



Clamping of RFD-...-UO



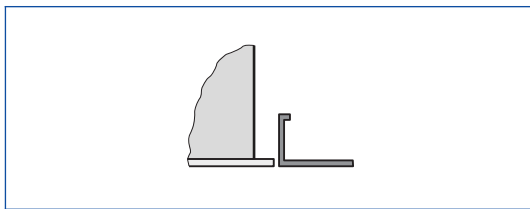
Diffuser face fixing with central screw

Ceiling cut-out

Produktvariante	125		160		200		250		315		400	
	a	Ød	a	Ød	a	Ød	a	Ød	a	Ød	a	Ød
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
RFD-Q-K	180	140	235	175	295	215	370	265	465	330	595	415
RFD-Q-D-K	180	170	235	205	295	233	370	283	465	380	595	480
RFD-Q-A		140		175		215		265		330		415
RFD-Q-D-A		170		205		233		283		380		480
RFD-R-K	180	140	235	175	295	215	370	265	465	330	595	415
RFD-R-D-K	180	170	235	205	295	245	370	295	465	380	595	480
RFD-R-UO		125		160		200		250		315		400
RFD-R-D-UD		165		200		240		290		375		460
RFD-R-A		140		175		215		265		330		415
RFD-R-D-A		170		205		245		295		380		480

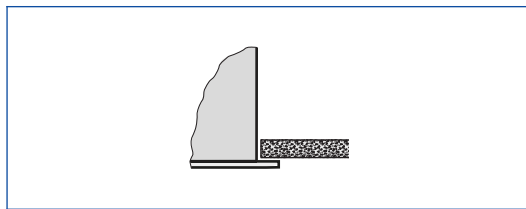
## Ceiling systems

### Installation into grid ceilings



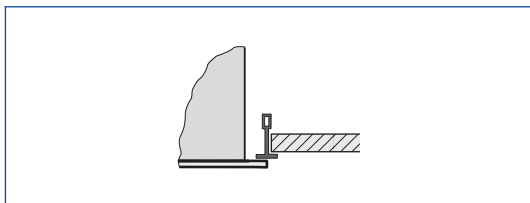
- Fix the plenum box to the ceiling
- The ceiling tile of the grid ceiling is independent of the ceiling diffuser
- Fix the diffuser face after the ceiling has been completed

### Installation in continuous ceilings



- Fix plenum box (including diffuser face, if necessary) to the ceiling
- Adjust plasterboard ceiling tile as required
- If necessary, fix the diffuser face after the ceiling has been completed

### Installation in T-bar ceilings



- Fix the plenum box to the ceiling
- The T-bar ceiling is independent of the ceiling diffuser
- Fix the diffuser face below the T-bars after the ceiling has been completed

## Volume flow rate balancing

When several diffusers are connected to just one volume flow controller, it may be necessary to balance the volume flow rates.

- Ceiling diffusers with universal plenum box and damper blade (variant -M): The diffuser face can be removed to access the damper blade; the damper blade can then be set to any position between 0 and 90°
- Ceiling diffusers with universal plenum box, damper blade and pressure tap (variant -MN): The diffuser face need not be removed since the damper blade can be set with two cords (white and green).

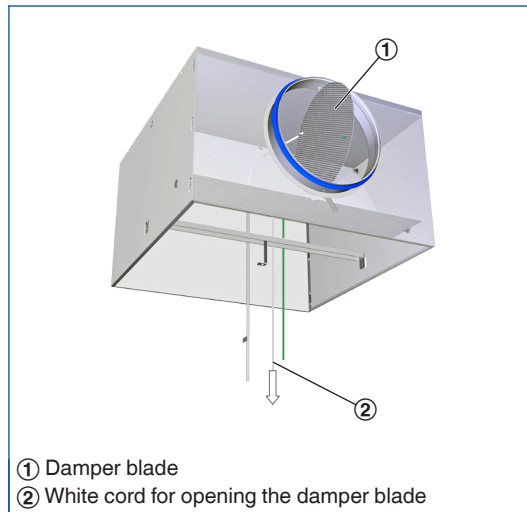
## Volume flow rate measurement

Ceiling diffusers with universal plenum box, damper blade and pressure tap (variant -MN) allow for volume flow rate balancing even with the diffuser face in place.

- Connect the measuring tube to the digital manometer
- Read the effective pressure
- Read the volume flow rate off the characteristic or calculate it
- If necessary, adjust the damper blade position with the cords

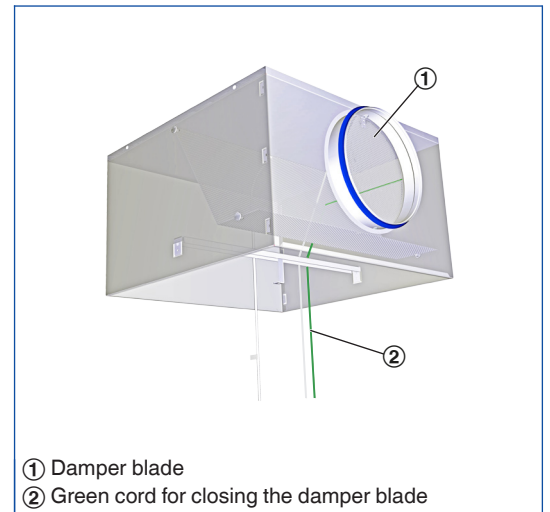
A characteristic is included with each AK-Uni plenum box.

### AK-Uni-...-MN Volume flow rate balancing



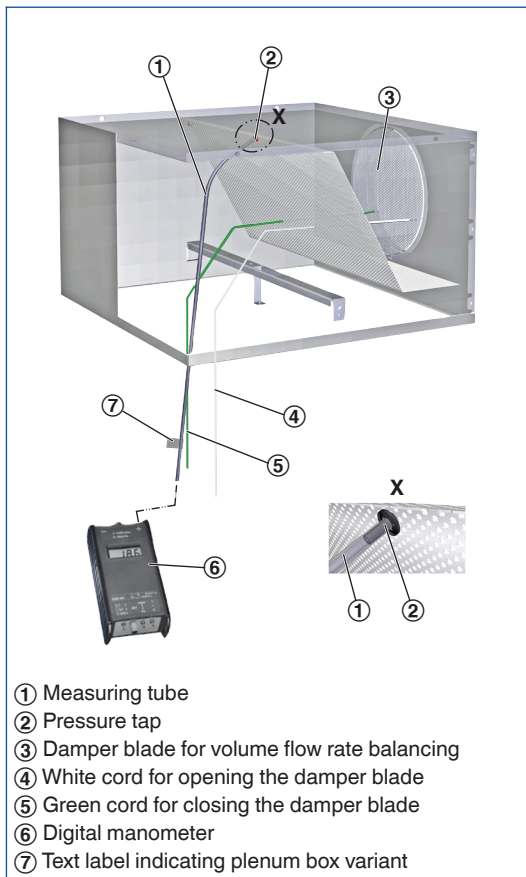
Open, 0°

### AK-Uni-...-MN Volume flow rate balancing



Closed, 90°

AK-Uni-...-MN volume flow rate measurement



Volume flow rate calculation for air density  
 $1.2 \text{ kg/m}^3$

$$\dot{V} = C \times \sqrt{\Delta p_w}$$

Volume flow rate calculation for other air  
densities

$$\dot{V} = C \times \sqrt{\Delta p_w} \times \sqrt{\frac{1.2}{\rho}}$$

### Principal dimensions

#### $\varnothing D$ [mm]

Outer diameter of the spigot

#### $\varnothing D_1$ [mm]

Outer diameter of a circular diffuser face

#### $\varnothing D_2$ [mm]

Diameter of a circular diffuser face style

#### $\varnothing D_3$ [mm]

Diameter of a circular plenum box

#### $\square Q_1$ [mm]

Outer diameter of a square diffuser face

#### $\square Q_2$ [mm]

Dimensions of a square diffuser face style

#### $\square Q_3$ [mm]

Dimensions of a square plenum box

#### $H_1$ [mm]

Distance (height) from the lower edge of the

suspended ceiling to the lower edge of the diffuser face

#### $H_2$ [mm]

Height of a ceiling diffuser, from the lower edge of the suspended ceiling to the upper edge of the spigot

#### $H_3$ [mm]

Height of a ceiling diffuser with plenum box, from the lower edge of the suspended ceiling to the upper edge of the plenum box or of the spigot

#### $A$ [mm]

Position of the spigot, defined by the distance of the spigot centre line to the lower edge of the suspended ceiling

#### $C$ [mm]

Length of the spigot

#### $m$ [kg]

Weight

### Nomenclature

#### $L_{WA}$ [dB(A)]

A-weighted sound power level of air-regenerated noise

#### $\dot{V}$ [ $m^3/h$ ] and [l/s]

Volume flow rate

#### $\Delta t_z$ [K]

Supply air to room air temperature difference, i.e.

supply air temperature minus room temperature

#### $\Delta p_t$ [Pa]

Total differential pressure

#### $A_{eff}$ [ $m^2$ ]

Effective air discharge area

All sound power levels are based on 1 pW.